

REMARKS

The indication that claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, is acknowledged. By the present amendment, claim 8 has been rewritten in independent form incorporating the features of parent claim 1 therein and claim 19 has been rewritten in independent form incorporating the features of parent claim 11 therein. Thus, claims 8 and 19 should now be in condition for allowance.

Applicants note that claims 9 and 10 stand withdrawn from consideration based upon the election of Invention I including claims 1 - 8 and 11 - 20, of the oral election thereof being confirmed herein. In light of the withdrawal of claims 9 and 10 of Invention II, from consideration, by the present amendment, claims 9 and 10 have been canceled without prejudice or disclaimer to the right to file a divisional application directed thereto.

Furthermore, by the present amendment, an informality in the specification has been corrected and independent claims 1 and 11 have been amended to clarify features of the present invention as illustrated in Fig. 1 of the drawings, for example. More particularly, as now recited in claims 1 and 11, and as illustrated in Fig. 1 of the drawings of this application, the optical information recording medium comprises a plurality of optical information recording layer units formed as a set of layers stacked on the substrate 1 within interposition of a transparent intermediate layer 10 between adjacent ones of the optical information recording layer units. As recited, each of the optical information recording layer units include an optical recording layer 2 and a plurality of dielectric multilayer reflecting layers laminated on the optical recording layer as represented by the layers 7 and 8, for example, and a variable refractive

index thin film 9 formed as a layer stacked within the dielectric multilayer reflecting layers and exhibiting non-linear and reversible change of its complex refractive index induced by light irradiation, as described at page 6, lines 15 - 18 of the specification, for example. Furthermore, as recited in claims 1 and 11, and as illustrated in Fig. 1, each of the dielectric multilayer reflecting layers is formed as a repetitive and alternate laminate of both low refractive index 7 and high refractive index thin films 8 successively stacked toward the substrate. Applicants submit that the features as now recited in independent claims 1 and 11 and the dependent claims which in some instances have also been amended, patentably distinguish over the cited art, as will become clear from the following discussion.

The rejection of claims 1 - 3, 5 - 7, 11 - 14, 16 - 18 and 20 under 35 USC 103(a) as being unpatentable over Hara et al (JP 03-091128) in view of Rosen et al (EP 0810590) and Shintani et al (2003/0039200), Sakaue et al ('451); the rejection of claims 1 - 3, 5 - 7, 11 - 14, 16 - 18 and 20 under 35 USC 103(a) as being unpatentable over Hara et al (JP 03-091128) in view of Rosen et al (EP 0810590), Shintani et al (2003/0039200), Sakaue et al ('451), and further in view of Kamiya et al '690; the rejection of claims 1 - 7 under 35 USC 103(a) as being unpatentable over Yamamoto et al (2004/0085882) with Rosen et al (EP 0810590) in view of Tseng et al (2004/0219455); and the rejection of claims 1 - 7 and 11 - 21 under 35 USC 103(a) as being unpatentable over Yamamoto et al (2004/0085882) with Rosen (EP 0810590) and Tseng et al (2004/0219455) in view of Kamiya et al ('690); such rejections are traversed insofar as they are applicable to the present claims and reconsideration and withdrawal of the rejections are respectfully requested.

At the outset, applicants note that the Examiner appears to have misinterpreted the characteristics of the variable refractive index film 9, based upon

the discussion in the paragraph bridging pages 9 and 10 of the office action, as a layer whose refractive index non-reversibly changes. However, as noted above, independent claims 1 and 11 have been amended to recite the feature that the variable refractive index thin film exhibits “non-linear and reversible change of its complex reflective index induced by light irradiation”. (emphasis added).

In accordance with the present invention, the structural arrangement as illustrated in Fig. 1 and as recited in independent claims 1 and 11 provides an optical information recording medium comprising a substrate 1, a plurality of optical information recording layer units (2, 3; 2'3') with a transparent intermediate layer 10 interposed therebetween. In accordance with the present invention, the plurality of dielectric multilayer reflecting layers formed as a repetitive and alternate laminate of both low refractive index films 7 and high refractive index thin films 8 successively stacked toward the substrate 1 have a variable refractive index thin film 9 formed as a layer stacked within the dielectric multilayer reflecting layers and exhibiting non-linear and reversible change of its complex refractive index induced by light irradiation. While the dielectric multilayer reflecting layers and the variable refractive index thin film which are arranged in the manner illustrated in Fig. 1 in a direct ion along which light from a light source propagates, the arrangement is such that the layers 7, 8 and 9 provide a layer structure which is transparent in a normal state and a refractive index of the layer 9 changes when exposed to light wherein a reflective index of the layer remarkably increases and a reflection index of any of selective layers also increase so that it becomes possible to read/write data for the recording layer 2. However, in a conventional multilayer recording medium, even though an intermediate layer may be formed between recording layers for avoiding cross talk among the recording layers and a non-transparent metal layer may be formed within

the recording layer, since light propagating the metal layer tends to attenuate due to light absorption within the metal layer, it is difficult to read data with an appropriate intensity, i.e., with a high S/N ratio. In the present invention, as is apparent from the description at page 49, lines 10 - 18 of the specification, an optical recording disk without attenuation of light is obtainable since the structural arrangement has a transparency only at a normal state. According to the present invention, the features enable a structure to become operable as a reflecting layer and as shown in Fig. 12 and the description in the paragraph bridging pages 34 and 35 to obtain a large reflectance even though a change of refractive indexes obtained so as to obtain a response of signal with a high S/N ratio. Applicants submit that such features are not disclosed or taught in the cited art, as will become clear from the following discussion.

Turning to Hara (JP-3-91128), this reference relates to a technique for improvement of image resolution by using a thin film including alternate laminate of high and low dielectric constant layers provided on a recording layer. In such arranged recording thin film, a refractive index is variable depending on intensity of light exposing the film. Since the properties of the recording layer changes in accordance with the light intensity, Hara et al does not disclose or teach a thin film having a nonlinear and reversible change of its complex refractive index and the other recited features of claims 1 and 11 and the dependent claims thereof. Thus, applicants submit that all claims patentably distinguish over Hara et al in the sense of 35 USC 103 and should be considered allowable.

Rosen et al (EP0810590) and Shintani et al (US 2003/039200) discloses both a conventional multilayer disk device and a multilayer optical disk in which a higher resolution film has been formed. Such a film is formed for increasing recording

density of the disk by sharpening a laser beam irradiating a surface of the disk. Rosen et al and Shintani et al fail to disclose or teach a reflecting film of stacked layer with high and low refractive index layers and a variable refractive index film having a nonlinear and reversible changing of its complex refractive index, as recited in independent claims 1 and 11 and the dependent claims. Further, Shintani only disclose a high resolution thin film with a non-linear optical thin film. Thus, applicants submit that all claims patentably distinguish over the cited art.

Sakaue et al (USP 6660451) does not disclose pairs of dielectric layers with a variable refractive index thin film, as taught, but rather suggests a recording layer between dielectric layers. Thus, applicants submit that all claims patentably distinguish over Sakaue et al taken alone or in combination with the other cited art.

Yamamoto et al (US 2004/85882) discloses a plurality of high dielectric constant layers on a reflecting layer and a recording layer. Although In Yamamoto et al, one of thin film within the high dielectric constant layers can be formed as a film whose refractive index reversibly varies, Yamamoto et al fails to disclose the structural arrangement, as claimed, and the features therewith. Also, applicants submit that Yamamoto et al is not properly utilizable under 35 USC 103(c), since Yamamoto et al and the present invention are commonly assigned and the requirements of 35 USC 103(a) are complied with.

Tseng et al (2004/0219455) also fails to disclose or teach the structural arrangement of pairs of dielectric films which are alternately low and high refractive index films and a variable refractive index thin film arranged in the manner set forth in the claims of this application. Thus, applicants submit that all claims patentably distinguish thereover.

Finally, with regard to Kamiya et al (US 5,001,690), irrespective of whether or not this patent discloses a tilt circuit for an optical disk play back device, Kamiya et al fails to disclose or teach an optical recording medium having the structure as recited in independent claims 1 and 11 and the dependent claims.

As is apparent from the rejections as set forth, the Examiner has engaged in a hindsight reconstruction attempt of the present invention taking bits and pieces from individual references and suggesting that it would be obvious to combine the same. However, as is apparent, the individual references taken alone or in any combination thereof, where properly utilizable, fail to provide the optical recording medium having the structural features as recited in independent claims 1 and 11 and the dependent claims thereof. Thus, applicants submit that all claims patentably distinguish over the cited art taken alone or in any combination thereof in the sense of 35 USC 103 and all claims should be allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims should be in condition for allowance and issuance of an action of a favorable nature is requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 500.43675X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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